REFUSE DERIVED FUEL: HAZARDOUS PLASTIC WASTE IN DISGUISE

AN IPEN PLASTIC WASTE BRIEFING

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As the plastic waste crisis deepens and countries around the world agree to restrict plastic waste exports and tighten controls on the movement of waste, at least one form of plastic waste has largely avoided trade regulations. Refuse derived fuel (RDF) is up to 50% mixed plastic waste yet is rarely subject to trade rules, despite being hazardous waste that is destined to burn in cement kilns and incinerators. This brief covers the key issues surrounding the RDF trade and why it should be regulated and eventually prohibited.

RDF AND THE BASEL CONVENTION

The Basel Convention on Hazardous Waste is intended to regulate harmful waste exported for burning, yet it remains silent on the classification of RDF. Some suggest that RDF is a fuel 'product' and thus should not be regulated by the Basel Convention. In reality, RDF is a mixed plastic waste that should not be exported without hazardous waste permits and notification to the importing country, as the Convention requires. Unfortunately, until the Basel Convention explicitly lists RDF as a mixed plastic waste, the controversy will continue, and countries will remain at risk of unknowingly importing hazardous plastic waste in disguise.

WHAT IS RDF AND WHY IS IT PRODUCED?

Refuse derived fuel is a mixture of wastes left over following recycling or for which there is no recycling available. Typically, it consists of around 35% mixed plastic waste plus synthetic (plastic) textiles and rubber (usually a synthetic plastic mix) resulting in about 50% mixed plastic. The plastic waste is combined with paper, cardboard, and timber wastes; other textiles; and other assorted combustible wastes. Together, the plastic and other combustible wastes are shredded and converted into either bales, pellets, or a material called 'fluff', which is simply loose, shredded RDF. There are many names for RDF, but all contain a similar mix of wastes. These names include, among others, Waste Derived Fuel, Process Engineered Fuel, and Solid Recovered Fuel. One version made almost entirely from waste auto tires (which are made from a mixture of rubber and plastic) is called Tire Derived Fuel.

RDF is typically burned as fuel in cement kilns but increasingly also in waste incinerators, industrial boilers, pulp mills, and thermal power plants. Smokestack industries claim that burning RDF reduces their carbon emissions by replacing a percentage of fossil fuels like gas and coal, but this is based on a controversial accounting system (see more on this, below). In reality, burning plastic waste is burning fossil fuels, as plastics are made from oil and petrochemicals. RDF is attractive to governments as burning the plastic waste makes it 'disappear' without having to limit plastic production or implement safer, toxics-free waste management systems.

WHO MAKES RDF?

Industrial and household waste is repackaged as RDF by several industry sectors. In some cases, the cement industry creates its own 'in-house' infrastructure to ensure the waste fuel meets its requirements. Typically, RDF is prepared by companies with dedicated equipment to shred, pelletise, or bale the waste and sold to industries that burn it as fuel. In some countries, cement industries pay local government staff or private contractors to prepare RDF, but it is often of very low quality and indistinguishable from municipal waste or plastic waste.

WHO BURNS RDF?

The main end users of RDF are cement plants that burn the waste as an alternative to traditional fossil fuels like coal, gas, and oil. Cement manufacture has intensive energy requirements due to the high temperatures needed to produce clinker, the precursor material in cement production. This also results in cement kilns having an extremely high carbon footprint.

THE RDF CARBON ACCOUNTING FRAUD

Cement manufacturers claim that burning RDF reduces their carbon emissions compared to using traditional fossil fuels, and this allows them to access carbon credits and other subsidies. In reality, there is little difference in carbon footprint as RDF is typically around 50% plastic waste when polymers from textiles and synthetic rubber are included. However, the 'biogenic' fraction of RDF (paper, cardboard, plant fibre, timber waste, etc) is erroneously considered 'renewable' or 'carbon neutral' under some regulatory systems, and the carbon generated from this fraction of the waste in RDF may not be counted as fossil fuel carbon, even though burning it generates similar amounts of carbon emissions. This is because *"burning biomass for energy provision increases the amount of carbon in the air just like burning coal, oil or gas if harvesting the biomass decreases the amount of carbon stored in plants and soils or reduces carbon sequestration."*[1] The time involved for new trees to grow and absorb carbon to replace the burned biogenic material (paper, carboard, and timber) is far too long to 'neutralise' climate change emissions. As noted by the Environment Justice Network, *"Several studies in recent years have debunked this "carbon neutrality" claim, showing that it takes decades for tree-regrowth to bring the emissions down to the level of coal, and centuries to approach carbon neutrality, which is never truly reached. These time frames are far too long for biomass to be a meaningful solution to global warming."*[2]

This accounting fraud allows cement manufacturers to claim they are reducing carbon emissions since the biogenic fraction of carbon emissions are not counted. Cement manufacturers refer to RDF and all other wastes (including hazardous wastes) they burn as *alternative fuels* (AF) and have a goal of increasing their *'thermal substitution rate'* (TSR) of alternative fuels to the maximum level possible. Globally, the industry is trying to achieve 50% TSR for all cement kilns with some examples reaching 90% TSR with AF. RDF is the main cheap, dirty fuel that cement kilns are using to increase TSR.

Waste incinerators, particularly in the Scandinavian countries, are using increasing amounts of imported RDF as they struggle to access enough municipal waste to burn. An overcapacity of incinerator construction combined with increasingly efficient domestic recycling rates has resulted in some of these countries relying on burning imported waste to generate heat and electricity. This trend may increase in Europe and other regions as incinerators increase demand for RDF.

Other industries that burn RDF on a smaller scale include pulp and paper mills, industrial boilers, and thermal power plants. All these combustion-based industries use the same argument about the carbon emission reduction potential of RDF.

1 Haberl, et. al., "Correcting a fundamental error in greenhouse gas accounting related to bioenergy," Energy Policy, 45 (2012) 18–23, pp.19-20. http://www.sciencedirect.com/science/article/pii/S0301421512001681

2 https://www.energyjustice.net/files/biomass/climate.pdf

RDF AND THE HIDDEN PLASTIC WASTE TRADE

The Basel Convention plastic waste amendments changed the landscape of plastic waste exports after numerous cases of plastic waste dumping and toxic contamination in developing countries. Mixed plastic waste exports are now considered *waste requiring special consideration* (Y48) or *hazardous waste* (A3210) subject to the same requirements as hazardous waste transboundary movements. The main requirement is that exporters must seek Prior Informed Consent (PIC) from the importing country and must provide information about the nature of the waste, which can result in refusal of the shipment. In addition, the Basel Ban Amendment prohibits the member states of the Organization for Economic Cooperation and Development (OECD), the European Union (EU), and Liechtenstein from exporting hazardous wastes, as defined by the Convention, to other countries – primarily developing countries or countries with economies in transition.

However, there is a lack of clarity in the Basel Convention and the legislation of many countries about whether RDF is a product or a waste. If it is a product, then the Basel Convention and transboundary notification procedures such as PIC do not apply. If it is waste, then the Basel Convention should regulate RDF as waste or hazardous waste. The high content of mixed plastic waste in RDF should require RDF to be classified as Y48 or A3210 requiring a hazardous waste permit for export and triggering the PIC process, at least for trade from the OECD, EU, and Liechtenstein. Countries in this grouping should be prohibited from exporting RDF to developing countries or countries with economies in transition.

Currently, there is confusion about the classification of RDF internationally which must be resolved. There is a significant risk that RDF constitutes hidden waste plastic exports that do not appear in either commodity trade data or plastic waste trade data. RDF is flying beneath the radar of customs and trade officials, allowing unregulated shipments of plastic waste around the world.

RDF IS HAZARDOUS WASTE

Issues around RDF were first raised by Australian NGOs that were concerned when the country was struggling to manage plastic waste and announced major increases in production and exports of RDF in their country. Following the release of a series of IPEN reports on Australian RDF, the Australian government developed strict new regulations on RDF exports. Australia now acknowledges that RDF falls under the *"Y48 category in Annex II of the Basel Convention and the Hazardous Waste (Regulation of Exports and Imports) Act 1989 (the Hazardous Waste Act) which gives effect to the Basel Convention in Australia. These types of exports therefore require a hazardous waste permit."*[3] Unfortunately, many countries seem unaware of this issue because the Basel Convention does not specifically address the status of refuse derived fuel as a mixed plastic waste requiring hazardous waste export permits.

3 https://www.dcceew.gov.au/environment/protection/waste/exports/plastic#toc_4

WHAT NEEDS TO BE DONE ABOUT RDF?

The Basel Convention should immediately provide guidance to Parties on the status of RDF as a waste that must be regulated due to its mixed plastic waste content (Y48 or A3210). This would mean that RDF should be subject to transboundary movement requirements for hazardous waste, and the PIC process should be triggered for any exports. Further, the export of RDF must be prohibited from countries in the OECD, the EU, and Lichtenstein to developing countries. In the short term, the Basel Convention should recommend that a specific harmonised system code number (HS code) should be assigned to RDF shipments to allow for direct tracking and assessment of the RDF trade. The current HS codes for waste are so broad that RDF can go undetected, as it may be documented under an umbrella code such as 'household wastes' with many other waste types.

In the long term, burning RDF must end. Burning plastic is highly toxic and is neither circular nor sustainable. Further, claims that it reduces carbon emissions rely on baseless accounting methods. Burning plastic leads to hazardous and toxic emissions and transfers contaminants to cement, exposing workers and contaminating the environment. Cement kilns are already successfully using hydrogen in trials as an alternative fuel which has no carbon or toxic emissions. This is the future of the cement industry, but it is expensive to transition and requires significant infrastructure investment. Burning plastic waste is cheap and delays the investment in hydrogen while maximizing cement industry profits.

National governments should not subsidize RDF use by the cement industry based on spurious arguments about RDF leading to carbon reductions. Misinformed politicians are attracted to RDF because it conceals the growing plastic waste crisis and provides a pretence that such waste is being sustainably managed. Subsidising and encouraging RDF production is wasted capital creating a technological lock-in to plastic waste burning that could be better spent on an immediate transition to an emission-free fuel such as hydrogen.

For more information on Refuse Derived Fuel, IPEN has collated a series of national reports which can be downloaded at https://ipen.org/news/plastic-waste-fuels.

A detailed video presentation based on these reports can be accessed at https://youtu.be/QgX46WgcYZw?si=AruuEOKljgAIYsZm.

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